

C L A I M S

1. Shaped catalyst or catalyst precursor containing a catalytically active component or a precursor therefor, the component selected from elements of Group VIII of the Periodic Table of the Elements, supported on a carrier,
5 which catalyst or catalyst precursor is an elongated shaped particle comprising three protrusions each extending from and attached to a central position, wherein the central position is aligned along the longitudinal axis of the particle, the cross-section of
10 the particle occupying the space encompassed by the outer edges of six circles around a central circle, each of the six circles touching two neighbouring circles whilst three alternating circles are equidistant to the central circle and may be attached to the central circle, minus
15 the space occupied by the three remaining outer circles and including the six interstitial regions.
2. Shaped catalyst or catalyst precursor according to claim 1, wherein the protrusions are helically wound around the longitudinal axis of the particle.
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3. Shaped catalyst or catalyst precursor according to claim 1 or 2, having a nominal diameter D in the range between 0.5 and 5 mm, preferably between 0.7 and 3 mm, more preferably between 1 and 2 mm.
4. Shaped catalyst or catalyst precursor according to
25 any one of claims 1 to 3, wherein the Group VIII element is Fe, Co or Ni, preferably Co.
5. Shaped catalyst or catalyst precursor according to any one of claims 1 to 4, containing an element or

compound selected from Group IIA, IIIB, IVB, VB, VIB, VIIIB or VIII of the Periodic Table of the Elements.

6. Shaped catalyst or catalyst precursor according to claims 1 to 5, wherein the carrier is a refractory oxide, 5 preferably silica, alumina or titania, more preferably titania.

7. Shaped catalyst or catalyst precursor according to claims 1 to 6, having a cross-section in which the three remaining alternating circles have diameters in the range 10 between 0.74 and 1.3 times the diameter of the central circle, preferably between 0.87 and 1.15 times the diameter of the central circle, preferably a shaped catalyst or catalyst precursor having a cross-section in which the three remaining alternating circles have the same diameter as the central circle, more preferably a shaped catalyst or catalyst precursor in which the three alternating circles are attached to the central circle. 15

8. Shaped catalyst or catalyst precursor according to claims 1 to 7, having a L/D ratio (mm/mm) of between 1 20 and 25, preferably between 2 and 10, preferably a shaped catalyst or catalyst precursor having a length in the range between 1 and 25 mm, more preferably between 2 and 20 mm.

9. Process for the preparation of a catalyst or catalyst precursor according to claims 1-8, by pressing, extruding 25 or otherwise forcing a granular or powdered catalyst or catalyst precursor material into various shapes under certain conditions, which will ensure that the particle retains the resulting shape, both during reaction as well as regeneration, preferably by extrusion.

10. Die-plate designed for use in the preparation of a catalyst or catalyst precursor by extrusion, wherein the die-plate comprises one or more orifices in the shape of 30

the cross-section of the carrier particles as defined in any of claims 1-8.

11. Process for the preparation of hydrocarbons by contacting a mixture of carbon monoxide and hydrogen with a catalyst as described in claims 1 to 8, the catalyst optionally being activated by contacting the catalyst precursor with hydrogen or a hydrogen containing gas.
- 5 12. Process for the preparation of fuels and optionally base oils from the hydrocarbons described in claim 11, by hydrogenation, hydroisomerisation and/or hydrocracking.
- 10 13. Fuels and base oils obtainable by a process as described in claim 12.